11 May 1956

AH-25 25X1

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MEMORANDUM FOR: THE RECORD

SUBJECT : Hole Drilling Demonstration [redacted] 25X1

1. A hole drilling demonstration on brick and concrete walls was conducted by TSS/ED at [redacted] on 9 May 1956. Demonstrated were carbon tip drills, diamond tip drills, and diamond core drills. Also demonstrated was a bicycle arrangement for driving the drills and an electric motor set in a special stand. 25X1

2. The bicycle power driving device consisted of a bicycle frame, with the drive connected to a flexible shaft. Power to the drill was furnished by a person pedaling the bicycle frame. To drive the drill it is necessary to pump the bicycle quite hard and for an average person, two minutes of pedaling is considered a normal work period. Under demonstration, one pedal sheared off, and further attempts to use this as a power source had to be abandoned.

3. The electric motor used was a 1600 RPM, $\frac{1}{4}$ hp, capacitance start motor. It was mounted in a tubular frame, the total unit weighing 32 pounds. A pressurized water tank was mounted on the frame also, to supply the water necessary for core drilling.

4. Using the electric motor as a power source, a series of holes were drilled in a 12 inch brick wall. Using a carbon tip drill, it required 12 minutes to drill through the brick wall. Using a diamond core drill, a hole was drilled through this brick wall in 4 minutes. In noise comparison, the diamond core drill was almost noiseless, while the carbon drill was not only very noisy, but set up vibrations in the wall that were audible from 25-50 feet.

5. Repeating the above tests on a 6 inch cement wall, it required 4 minutes and 15 seconds to drill through it with a diamond core drill. Using a carbon drill, only $\frac{1}{4}$ inch was drilled in one minute or a time elapse of 24 minutes for 6 inches. Again, the noise level of the diamond core drill was low. Using a diamond tip drill and air pressure to blow residue out, a hole was drilled through the 6 inch concrete wall in less than 4 minutes. The speed up in drilling time was due to the greater pressure which can be exerted on a diamond tip drill.

6. The diamond core drill's main drawback is that a drill is only good for about 6 inches of drilling before the core must be removed from the drill. Operationally, this obstacle could be overcome by the use of a series of drills. Another drawback of core

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drills is that water is required for cooling. This necessitates the use of sponges to keep water from flowing down the wall. Even considering the above two drawbacks, the core drills overall performance was outstanding, due to the speed of drilling and the low noise level.

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TSS/APD

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AWS/ls (10 May 56)